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ABSTRACT

Throughout the United States, kindergartens receive children with increasingly diverse levels of skills. In order to provide a learning atmosphere that is supportive of all children, prekindergarten teachers must be equipped to adapt to each child's needs. This paper reviews the research on pre-kindergarten teacher quality. The purpose of the review is to highlight teachers with bachelor's degrees and their direct link to quality in early education and care. The review is limited to studies that distinguished bachelor's degrees from other levels of education, and restricted to articles published in peer reviewed journals or reports issued by agencies that subject their reports to peer-advising. This resulted in eight studies that specifically explore the benefits of pre-K classrooms when teachers have bachelor's degrees and specialized training in early childhood education. Among the findings of the studies reviewed are the following: (1) teachers with four-year degrees in early childhood education rated higher in positive interaction with children than those without these credentials, and were less detached, less authoritarian and less punitive; (2) children who had teachers with a bachelor's or associate's in early childhood education demonstrated stronger receptive vocabularies that those with teachers holding only a high school diploma; and (3) retaining the greatest number of teachers with bachelor's degrees or more was the strongest predictor of whether a center maintained a high level of quality over time. Taken as a group, these studies strongly show the importance of not simply more education, but specifically how the requirement of a bachelor's degree with specialized early childhood training can be parlayed into securing high quality center-based pre-kindergarten programs. (Contains 32 references.) (HTH)

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Bachelor's Degrees Are Best: Higher Qualifications for Pre-Kindergarten Teachers Lead to Better Learning Environments for Children.

Marcy Whitebook

The Trust for Early Education

2003

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Bachelor's Degrees Are Best:
Higher Qualifications for Pre-Kindergarten Teachers Lead to Better Learning Environments for Children

A review of the research prepared for the Trust for Early Education

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Executive Summary
Good teachers for our youngest students

This fall—like every other fall—about four million 4- and 5-year-olds will walk through the kindergarten door for the very first time. Some will burst through the doors full of excitement. Other children may cling and go only reluctantly. Some will arrive with the academic and social skills that assure a good position at the starting line, but too many will come through the door without having had the opportunities needed for a strong start. To them school will seem like a game that is rigged against them before they've even begun.

Throughout the United States, kindergartens receive children with increasingly diverse levels of skills. Strong pre-kindergarten programs can guarantee every child is well prepared for kindergarten. While many factors determine the quality of a pre-kindergarten program, none is as important as the quality of the teachers.

In order to provide a learning atmosphere that is supportive of all children, pre-kindergarten teachers must be equipped to adapt to each child's needs. In this paper commissioned by the Trust for Early Education, Marcy Whitebook, Ph.D. surveys the research on pre-kindergarten teacher quality. These reports and studies all echo the same message: pre-K teachers who have at least a bachelor's degree coupled with specialized training in early childhood development/education provide the best preparation for pre-kindergarteners' advancement to the next level.

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The Trust for Early Education (TEE) was established in 2002 by The Education Trust with a grant from The Pew Charitable Trusts and other funders.

The Trust for Early Education believes that all 3- and 4-year-olds should have access to high quality early education. Teachers shape the learning opportunities and experiences in their classroom. To engage children in learning and present them with the appropriate balance of knowledge and skills, teachers must be well educated and well trained. Therefore, all pre-kindergarten teachers should have at least a Bachelor's degree with specialized training in early childhood development or education.

The research literature on the quality of early education and care supports TEE's position that teacher education and training relate to quality. Specifically, classrooms where the teachers have at least a Bachelor's degree are more likely to be of higher quality—as in richer language environments, richer literacy environments, and better teacher-child interactions. Moreover, the teachers themselves are more likely to appropriately approach instruction—they are more sensitive, less punitive, and more engaged.

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Vocabulary is a critical building block for later literacy. Research has established a strong link between the number and complexity of words spoken by adults—both parents and teachers—and the number and complexity of words spoken by children. When children are exposed to larger vocabularies and more complex speech, at home and at school, they respond with greater comprehension and more complex speech themselves. To help children build strong vocabularies we must provide them with highly literate teachers who themselves have rich and wide vocabularies.

The National Adult Literacy Survey tells us that adults with Bachelor's degrees have significantly higher literacy levels than do adults with less formal education—having teachers with at least Bachelor's degree in every child's pre-kindergarten classroom increases the chances that they will be taught by people with appropriate literacy levels.

A very recent evaluation of Georgia's pre-kindergarten program by Georgia State University tells us that no matter the setting (public, private, Head Start), quality relates to children's outcomes. And, that high quality is significantly related to teacher education.

Pre-kindergarten teachers are entrusted with the critical responsibility of establishing a solid foundation for school kids. If done well, their students will make an easy, solid transition to kindergarten. But if not, we will continue to send kids to kindergarten feeling a need to catch up before they even had a chance to begin.

The study

The purpose of this review is to highlight teachers with bachelor's degrees and their direct link to quality in early education and care. We limited our literature review to studies that distinguished bachelor's degrees from other levels of education and training. We also restricted our research to articles published in peer-reviewed journals or reports issued by agencies that subject their reports to peer-advising. In all, we found eight studies that specifically explore the benefits to pre-K classrooms when the teachers have bachelor's degree and specialized training in early childhood education. Also included are large-scale investigations of center-based early education, conducted over the last fifteen years.

Taken as a group, these studies strongly show the importance of not simply more education, but specifically, how we can parlay requiring bachelor's degrees with specialized childhood training into securing high quality center-based pre-kindergarten programs.

Here is a listing of the articles presented in this review, along with the relevant citations.

- Bermuda College Training Program Study (Arnett, 1989)
- National Child Care Staffing Study (Howes, Phillips and Whitebook, 1992; Whitebook, Howes and Phillips, 1990)
- Cost, Quality and Child Outcomes Study (Blau, 2000; Helburn, 1995; Howes, 1995; Howes, 1997; Phillipsen, Burchinal, Howes and Cryer, 1997)
- Florida Quality Improvement Study (Howes, 1997; Howes, Galinsky, Shinn, Gulcur, Clements, Sibley and Abbott-Shimm, 1998)
- Three-State Study (Massachusetts, Georgia and Virginia) (Phillips, Mekos, Scarr, McCartney and Abbott-Shim, 2000; Scarr, Eisenberg and Deater-Deckard, 1994)
- Head Start FACES Study (Zill, Resnick, Kim, Hubbell-McKey, Clark, Pai-Samant, Connell, Vaden-Kiernan, O'Brien and D'Elio, 2001)
- New Jersey Studies (Barnett, Tarr, Lamy and Frede, 1999; Barnett, Tarr, Lamy and Frede, 2001)
- Then and Now: Changes in Child Care Staffing (Whitebook, Sakai, Gerber and Howes, 2001; Whitebook and Sakai, in press)

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Summary of findings

Based on a small but diverse sample of 50 teachers in Bermuda, Arnett (1989), advanced the argument for B.A.'s and college-level training in early childhood education with the **Bermuda College Training Program Study**. The study, which took place in 22 of 23 centers that serve pre-kindergarten-age children, found that the teachers with four-year degrees in early childhood education rated higher in positive interaction with the children than those without these credentials. In addition, those teachers with bachelor's degrees and specialized training were less detached, less authoritarian and less punitive than all other teachers in the sample.

The National Child Care Staffing Study (NCCSS) (Howes, Phillips and Whitebook, 1992; Whitebook et al., 1990) examined the quality of care in 227 child care centers, randomly selected from five diverse U.S. metropolitan areas. Similar to previous studies, NCCSS researchers found teachers' education was strongly related to positive interactions with children at the classroom level. They revealed that the teachers with bachelor's degrees (with or without college-level specialized training) were more sensitive, less harsh and less detached than teacher's without bachelor's degrees. The study also revealed that children in programs with sensitive and responsive teachers received higher language scores, and exhibited a higher level of peer play than other children.

Like the NCCSS, the **Cost and Quality and Child Outcomes** (CQCO) study looked at the role education plays in classroom relations and teacher performance. In the pre-kindergarten classrooms, higher quality learning environments were associated with the lead teacher having a B.A. or at the very least, some college. Children in this study who had teachers with a B.A./A.A. in early childhood education demonstrated stronger receptive vocabularies (could understand more words) than did children in classrooms with teachers having only high school backgrounds. Teachers with the most advanced education were the most effective overall.

The same methods used in the CQCO study were also employed for the **Florida Quality Improvement Study**, except additional teacher behavior categories were added. This time, children whose teachers had at least a B.A. in early childhood education not only engaged in more creative activities than children in other classrooms, they also had higher percentages of responsive classroom involvement as well.

The Three State Study (Scarr et al., 1994), which included Massachusetts, Georgia and Virginia, determined that in addition to education, wages and compensation are also key factors in the level of quality of pre-K classrooms. Although teacher education and training did have links to classroom characteristics, in this study, teacher wages emerged as the most visible factor connected with recruiting and retaining highly qualified staff.

The Trust for Early Education firmly believes that every pre-kindergarten aged child should be in a classroom with a teacher with at least a Bachelor's degree with specialized training in early childhood development or education.

To do this, we must improve the quality and expand teacher education and training programs at the postsecondary level. We must strengthen the teacher education infra-structure by creating pre-kindergarten teacher education programs that value content, methods, and an understanding of early childhood development.

To produce the workforce we need to provide high quality early education to all 3- and 4-year olds, and to improve the existing workforce, we need a seamless system of transfer from two-year colleges to four-year. And, we need to make available financial aid targeted to pre-kindergarten teachers.

We also need to ensure that high quality inservice professional development programs are available to all teachers, so that through out their careers they have the opportunity to continually hone their knowledge and skills ans stay up to date on the most current resources in their field.

Finally, to bring new people into the workforce and to retain existing educated, trained pre-kindergarten teachers we need to offer fair compensation, with pay and benefits commensurate to their education and training.

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The Head Start FACES (Families and Child Experiences Survey) study was designed to identify the critical elements that lead to positive outcomes for children in the Head Start program.

Researchers found that productive classrooms included teachers with four-year degrees or higher. The more education the teachers had, the more they exemplified positive attitudes and knowledge about early childhood education, translating into more productive and comfortable learning environments for the children.

The **New Jersey Studies** are part of an ongoing effort to assess the quality of early care and education. These studies found that the highest quality programs were those which required teachers to have bachelor's degrees.

Similar to the Three State Study, **Then and Now: Changes in Child Care Staffing, 1994-2000** (Whitebook, Sakai, Gerber and Howes, 2001; Whitebook and Sakai, in press) also sheds some light on how wages influence center quality. The study examined the percentage of staff who either stayed or left centers over time, their wages, and the impact these factors had on center quality. It's worth mentioning that it was not merely the presence of B.A. -level teachers who helped establish higher quality, but also the "turnover climate" of the center. This is defined as the percentage of teachers with at least a B.A. and specialized early childhood training who were retained at the centers between observations. The final result showed that retaining the greatest number of teachers with bachelor's degrees or more was the strongest predictor of whether a center maintained a high level of quality over time.

Conclusion

For those who develop and implement early care and education programs, the most important aspect of their job is ensuring that young children consistently encounter teachers who are sensitive and able to create positive learning environments. Teachers of young children are increasingly called upon to have more versatility in pre-K classrooms, and their performance and actions in the classroom is an undeniable link to children's development.

Our objective is that all pre-kindergarteners, not just a fortunate few, have access and exposure to the best teachers who are going to prepare them academically and socially, thus requiring pre-K teachers to have bachelor's degrees in specialized training in early childhood development is a necessity. The research in this review firmly anchors that point. These are the teachers who are best equipped to lay the groundwork for an optimistic and rewarding experience in pre-kindergarten and beyond.

Early Education Quality: Higher Teacher Qualifications for Better Learning Environments

This fall—like every other fall—about four million 4- and 5-year-olds will walk through the kindergarten door for the very first time. Some will burst through the doors full of excitement. Other children may cling and go only reluctantly. Some will arrive with the academic and social skills that assure a good position at the starting line, but too many will come through the door without having had the opportunities needed for a strong start. To them school will seem like a game that is rigged against them before they've even begun.

Throughout the United States, kindergartens receive children with increasingly diverse levels of skills. Strong pre-kindergarten programs can guarantee every child is well prepared for kindergarten. While many factors determine the quality of a pre-kindergarten program, none is as important as the quality of the teachers.

While there are many factors that define a good pre-kindergarten program, the most current research shows that the qualifications of the teachers are essential. According to the research, pre-kindergarten teachers with a bachelor's degree and specialized training in early childhood education are the most likely to have the skills that develop better outcomes for children. Such teachers are more likely to be sensitive and attentive to their young students; they are less directive and more responsive; and their interactions with children are more constructive. Students of these teachers produce higher language scores and are themselves more attentive in the classroom—skills that lay an important foundation for kindergarten.

... pre-kindergarten teachers with a bachelor's degree and specialized training in early childhood are the most likely to have the skills that develop better outcomes for children.

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Increasingly, policymakers are recognizing the importance of early learning experiences. States and communities throughout the country are currently planning or implementing initiatives to assure greater access to high quality, publicly supported preschool services. In order to design strong programs, planners need accurate information about the factors that lead to best practices and best outcomes—particularly in the area of professional preparation for teachers.

Indeed, the national trend is to raise teacher qualifications, with an emphasis on college degrees in early childhood education (ECE), child development (CD) or a related field. Head Start has raised its standards to require every classroom to have an associate degree-level (A.A./A.S.) teacher by fall 2003, and the pending reauthorization bill sets a new goal of 50 percent of Head Start teachers holding a bachelor's degree (B.A./B.S.) by 2008.

Despite these high-profile efforts to raise standards, pre-kindergarten teacher requirements remain highly variable across the states. Table 1(Barnett, 2003) shows where the states have currently set their minimum post-secondary degree standards for teachers in state-financed pre-kindergarten (pre-K) programs. These range from 24 credit hours in California to a master's (M.A.) degree (after five years of employment) in New York.

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Table 1: Minimum Post-Secondary Degree Requirements for Preschool Teachers, By State

State	State Financed Pre-K	Child Care[8]
ALABAMA	BA[1]	None
ALASKA*	CDA[5]	None
ARIZONA	CDA	None
ARKANSAS	BA[1]	None
CALIFORNIA	40 credits[6]	6 credits[3]
COLORADO	CDA	None
CONNECTICUT	CDA	None
DELAWARE	CDA	CDA
DISTRICT OF COLUMBIA	BA	CDA
FLORIDA	None	None
GEORGIA	AA[1]	None
HAWAII	CDA	CDA
IDAHO	N/A	None
ILLINOIS	BA[1]	CDA or CCP
INDIANA	N/A	None
IOWA	None	None
KANSAS	BA	CDA
KENTUCKY	CDA	None
LOUISIANA	BA[1]	None
MAINE	BA[1]	None
MARYLAND	BA[1]	None
MASSACHUSETTS	3 credits[4]	3 credits[4]
MICHIGAN	AA	None
MINNESOTA	CDA	CDA
MISSISSIPPI	N/A	None
MISSOURI	CDA	None
MONTANA	N/A	None
NEBRASKA	BA[1]	None
NEVADA	BA[1]	None
NEW HAMPSHIRE	CDA[5]	12 credits7
NEW JERSEY	BA[1]	CDA
NEW MEXICO	None	None
NEW YORK	BA	None
NORTH CAROLINA	AA[1]	None
NORTH DAKOTA	N/A	None
OHIO	AA[1]	None
OKLAHOMA	BA[1]	None
OREGON	CDA	None
PENNSYLVANIA	BA	None
RHODE ISLAND	BA[1]	BA[1]
SOUTH CAROLINA	BA[1]	None
SOUTH DAKOTA	N/A	None
TENNESSEE	BA[1]	None
TEXAS	BA[1]	None
UTAH	N/A	None
VERMONT	BA[1]	12 credits[4]
VIRGINIA	CDA	None
WASHINGTON	AA[1]	None
WEST VIRGINIA	BA	None
WISCONSIN	BA[1]	None
WYOMING	N/A	None

AA – Associates Degree; BA – Bachelor's Degree; CDA – Child Development Associates Credential;
Pre-K – Prekindergarten; CCP - Certified Childcare Professional.
N/A – state does not provide finances for pre-k; None – no post-secondary degree requirements.
1 - with courses or certification in early childhood.
2 - many states require professional training or ongoing development.
3 - 2 year vocational child care course or 6 credits in early childhood education.
4 - in topics related to early childhood education or child development.
5 - Head Start requirements used because all state pre-k funds supplement Head Start program;
6 - 24 credits in early childhood education and 16 credits more in general education;
7 - in early childhood education, 6 of which may be non-credit courses.
8 - update June, 2003.

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Inconsistent—and in many cases, inadequate—standards for pre-kindergarten teachers are in sharp contrast to current policy trends in K-12 education which increase the demand that teachers be better educated in their fields. The Research Council of the National Academy of Sciences argues that there exists a serious "mismatch" between the preparation (and compensation) of early childhood teachers and the expectations for their jobs: i.e., helping children develop the knowledge and skills essential for success in the school years and beyond (Bowman et al. 2001). But if teachers are required to have bachelor's degrees, specialized training, and credentials once children reach kindergarten, then why are the requirements not the same for our pre-kindergarten teachers?

Dr. Jack Shonkoff of Brandeis University, the chair of the National Research Council Committee on Integrating the Science of Early Childhood Development, was succinct in posing the question recently to Congress:

> How can the recently enacted No Child Left Behind Act emphasize the need for stronger performance standards and financial incentives to attract bright and highly motivated [K-12] teachers, while we simultaneously tolerate large percentages of inadequately trained and poorly compensated providers of early child care and education who have an important influence on the foundations of school readiness? (Testimony to the U.S. Senate Committee on Health, Education, Labor and Pensions, February 12, 2002, p.3.)

Review of the Research

This paper will review what the scientific research literature tells us about the relationship between pre-kindergarten teacher preparation and outcomes for children in early childhood education. This review focuses on one central question—whether teachers with a bachelor's degree in early childhood education (or higher) provide better pre-kindergarten experiences than teachers with less education and training.

Relatively few studies have dealt directly with this question or posed it exactly this way. Some have dealt more generally with the issue of college-level education for early childhood teachers (without distinguishing four-year-degrees from two-year-degrees or other combinations of education and training). Nevertheless, our review of the literature indicates a reasonably strong basis for addressing our central question: does specialized bachelor's-level preparation contribute to a strong pre-kindergarten program and better outcomes for children?

... if teachers are required to have bachelor's degrees, specialized training, and credentials once children reach kindergarten, then why are the requirements not the same for our pre-kindergarten teachers?

We restricted our literature review to research on center-based settings and articles published in peer-reviewed journals or reports issued by agencies that subject their reports to peer advising. Most of the studies reviewed here have been published in journals, with a few released as freestanding reports. For some of the large-scale studies,

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such as the Cost, Quality and Child Outcomes Study, the National Child Care Staffing Study, the Florida Quality Improvement Study, and the Then and Now Study, both peer-reviewed articles and final reports were consulted. Since the purpose of this review is to address the relationship of teachers with bachelor's degrees to quality in early education, we also restricted our literature review to the research that distinguished bachelor's degrees from other levels of education and training. For more details on the methodology of selecting articles, please see the technical notes section.

Eight studies specifically explore the relative contributions of a bachelor's degree and specialized early childhood training to teacher behavior and program quality. Among them are the large-scale investigations of center-based early education conducted over the last fifteen years. Taken as a group, these studies strongly suggest that teachers' education makes an important contribution to creating a high-quality, center-based preschool program. Moreover, it's not simply more education that makes the difference, but a bachelor's degree and specialized early childhood training at the college-level.

Although these studies have a variety of strengths and weaknesses, they include those with the largest and most diverse samples and those employing the most rigorous analyses. To show the evolution of research and findings in the field, we present the research articles in chronological order. Many of the research articles employ the same measures of quality and use similar terminology.

The articles we reviewed are:

- Bermuda College Training Program Study (Arnett, 1989)
- National Child Care Staffing Study (Howes, Phillips and Whitebook, 1992; Whitebook, Howes and Phillips, 1990)
- Cost, Quality and Child Outcomes Study (Blau, 2000; Helburn, 1995; Howes, 1995; Howes, 1997; Phillipsen, Burchinal, Howes and Cryer, 1997)
- Florida Quality Improvement Study (Howes, 1997; Howes, Galinsky, Shinn, Gulcur, Clements, Sibley and Abbott-Shimm, 1998)
- Three-State Study (Massachusetts, Georgia and Virginia) (Phillips, Mekos, Scarr, McCartney and Abbott-Shim, 2000; Scarr, Eisenberg and Deater-Deckard, 1994)
- Head Start FACES Study (Zill, Resnick, Kim, Hubbell-McKey, Clark, Pai-Samant, Connell, Vaden-Kiernan, O'Brien and D'Elio, 2001)
- New Jersey Studies (Barnett, Tarr, Lamy and Frede, 1999; Barnett, Tarr, Lamy and Frede, 2001)
- Then and Now: Changes in Child Care Staffing (Whitebook, Sakai, Gerber and Howes, 2001; Whitebook and Sakai, in press)

Definitions of Measures

Caregiver Interaction Scale: An observer rates the teachers and/or care provider referencing interactions with the child. Ratings range from not at all true to very true. Behaviors include such things as "listens attentively," "pays positive attention" to "seems critical," and "speaks with irritation." The scale yields information on teacher sensitivity, punitiveness and detachment.

Prenatal Modernity Scale: A measure of child rearing attitudes that assess authoritarianism (a less than desirable trait in teachers of young children, for this indicates that teachers may be overly directive).

ECERS/ITERS: Early Childhood Environment Rating Scale/Infant Toddler Environmental Rating Scale. A measure of "process" quality—such as, teacher and child interactions, language envioronment, and resources in the room.

The Bermuda College Training Program

Arnett (1989) advanced the discussion of the importance of a B.A. and college-level training in early childhood education to securing a high-quality pre-kindergarten program. The study is based on a relatively small but diverse sample of 50 teachers, in 22 of the 23 centers in Bermuda serving preschool-age children. Some of the teachers had no prior early childhood training, had taken two courses at the Bermuda College Training Programs, or had taken four such courses, the remainder had earned a four-year degree in early childhood education. Teachers were observed for two 45-minute periods on two days, by two different observers who were blind to teacher education level. Observers used the Caregiver Interaction Scale, at the time newly developed by Arnett (1989), which is also employed in several of the later studies described in this review. Child rearing attitudes were measured using the Prenatal Modernity Scale (Schaeffer, Edgerton and Aaronson, 1978).

Teachers with a four-year early childhood education degree were rated significantly higher in positive interaction, significantly lower on punitiveness and detachment, and less authoritarian than all other teachers in the sample. Those with two or four years of the Bermuda College Training were significantly less authoritarian in their child rearing attitudes than caregivers with no training. They were also rated higher on positive interaction and lower on detachment than those with no training.

Because the analyses did not address pre-existing motivational or other differences among the various groups of teachers, it is difficult to tease apart the particular impact of training. The study did include evidence suggesting that the first year of training, focused on child development and communication, vs. the second year, which focused on curriculum activities, accounted for differences in behaviors and attitudes between those with some training and those without. This suggests that along with formal education, the *content* of training is critical to outcomes for children.

The National Child Care Staffing Study

The National Child Care Staffing Study (NCCSS) (Howes, Phillips and Whitebook, 1992; Whitebook et al., 1990) examined the quality of care in 227 child care centers, randomly selected from five diverse U.S. metropolitan areas. Observations using the Early Childhood Environment Rating Scale (ECERS) (Harms and Clifford, 1980), Infant Toddler Environment Rating Scale (ITERS) (Harms and Clifford, 1980) and Caregiver Interaction Scale (Arnett, 1989) were conducted in infant, toddler and preschool classrooms in each center. Background information on teacher education and training was collected from 865 teachers and 444 assistant teachers. Best known for establishing the link between teaching staff wages, staff stability, and program quality, the NCCSS

Teachers with a four-year early childhood education degree were rated higher in positive interaction and lower on punitiveness and detachment...

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also explored the influence of teacher background on classroom quality and child outcomes. Predictions of teacher behavior based on teacher characteristics were tested both at the individual level, using the Caregiver Interaction Scale, and at the classroom level, using the ECERS or ITERS as appropriate. Researchers tested relationships, varying the orders and combinations in which formal education, specialized training and experience were entered into the equations. Teaching staff were categorized into five levels of training and education: 1) a B.A. and college-level early childhood education coursework; 2) a B.A. with no specialized early childhood education training; 3) no B.A. but college-level ECE; 4) no B.A. but specialized early childhood education training at the high school or vocational school level, and 5) no B.A. and no specialized training.

Similar to previous studies, NCCSS researchers found that education was a strong predictor of appropriate interactions with children (sensitive and engaged) at the classroom level, as were adult-child ratios and wages. Education accounted for a significant percentage of the variance.

Children in programs with more sensitive teachers and more responsive caregiving received higher language scores, spent less time aimlessly wandering, and exhibited a higher level of peer play and, this study found that teachers with a B.A. were significantly more sensitive, less harsh and less detached than teachers without a B.A.

The NCCSS points to the tangled relationship between formal education and specialized training. Formal education was a stronger predictor, but specialized training was also important. This relationship is difficult to tease apart because, in this sample and many others (Howes, 1995; Whitebook and Sakai, in press), most B.A. -level teachers also had completed early childhood education coursework at the college-level.

Children in programs with more sensitive teachers and more responsive caregiving received higher language scores, spent less time aimlessly wandering, and exhibited a higher level of peer play and, this study found that teachers with a B.A. were significantly more sensitive, less harsh and less detached than teachers without a B.A.

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Definitions of Measures

Woodcock Johnson: An individually administered, untimed assessment of children's early reading and math knowledge and skills.

Classroom Behavior Inventory: This measure provides information on children's behavior. It measures such things as child's activity level, attention level and shyness.

The Cost, Quality and Child Outcomes Study

Conducted several years later, the Cost, Quality and Child Outcomes Study (CQCO) replicated many of the NCCSS findings concerning the mediocre quality of center-based care in the United States, the impact of teacher wages, and the important role of teacher education and specialized training. It also extended our understanding of center finances and the differential impact of high-quality programs on children from low-income families. The CQCO study examined the quality of care in 400 child care centers. It drew from a stratified random sample of full-day centers in four states representing the range of program auspices in each community. The study included 370 preschool classrooms and 122 infant/toddler classrooms. Observers used the ECERS, the ITERS, the Caregiver Interaction Scale, the Woodcock-Johnson (1990) reading and math subscale (to assess pre-academic skills), and the Classroom Behavior Inventory (to look at social development) (Schafer et al., 1978).

The CQCO study examined the correlations between different measures of quality. It also focused on the extent to which individual predictors were associated with quality when controlling for other variables. Specifically, researchers examined the background of the lead teachers to ascertain the role that teacher education and training played in program quality and teacher behavior. Because teacher education and training were so highly correlated, lead teachers were categorized according to whether they had a B.A., some college, or a high school diploma (Helburn, 1995; Howes, 1995).

Like the NCCSS, the CQCO study looked at the role of teacher education in predicting both classroom interactions, as measured by the ECERS, and individual teacher behavior, as measured by the Caregiver Interaction Scale. In preschool classrooms, higher quality learning environments (i.e., higher ECERS scores) were associated with the lead teacher having a B.A. or, to a lesser extent, at least some college. But education alone did not explain quality: process quality (children's actual experiences in the classroom, often measured by observational tools such as the ECERS) was higher in classrooms where teachers had completed more education, had a moderate amount of experience, and earned higher wages. For teacher sensitivity, the significant teacher background variables included whether the lead teacher had either a B.A., or some college experience. While greater teacher sensitivity was associated with more education, lower sensitivity was found among teachers with extensive experience. Higher levels of teacher responsiveness were related to adult-child ratios, but not to individual teacher characteristics.

In preschool classrooms, higher quality learning environments (i.e., higher ECERS scores) were associated with the lead teacher having a B.A.

Because of the high levels of correlation among teacher formal education and specialized training, additional analyses were conducted to clarify the relative contributions of training and education (Howes, 1997). Eighty-one percent of lead teachers in the CQCO study could be categorized into four of the five groups in

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which formal education and specialized training were combined: 1) high school plus a few workshops in early childhood education; 2) a child development associate certificate; 3) some college courses in early childhood education; 4) a two-year degree in early childhood education; or 5) a B.A. or more advanced degree in early childhood education. Since only a few teachers in the sample had received a child development associate certificate, this group was dropped from the analyses.

Teachers with the most advanced education were the most effective (sensitive, responsive, constructive) overall. Teachers with a B.A. or more advanced degree in early childhood education were rated as more sensitive than teachers with an A.A. in ECE, who in turn were rated as more sensitive than teachers with other backgrounds. Teachers with a B.A. or an A.A. were less harsh (e.g., more constructive) than teachers with other backgrounds. They were also observed to be more effective than teachers with some college or just high school plus workshops, and more responsive than teachers with other backgrounds. Children in classrooms with teachers who had a B.A. or an A.A. degree in early childhood education demonstrated stronger receptive vocabularies (could understand more words) than did children in classrooms with teachers having only high school backgrounds.

The Florida Quality Improvement Study

In order to address the complex interrelationship of formal education and specialized early childhood training, Howes also analyzed data from the Florida Quality Improvement Study, using the same categories of blended education and training as described above for the CQCO study. Ninety-two percent of the teachers from the Florida sample fit into the predetermined categories. Since very few teachers in this sample had an A.A. in early childhood education, this category was dropped, but the child development associate certificate was included. The Florida study involved 150 centers from four counties. The sample was stratified according to the percentage of subsidized children in the centers, with those serving more than 50 percent children on subsidies defined as "low-income" centers, and those serving less than 50 percent defined as "high-income" centers.

The same procedures were employed in the Florida Study as in the CQCO, except that additional teacher behavior categories were added to the observation in the Caregiver Interaction Scale. Among her findings:

- Teachers with at least a B.A. in early childhood education were rated as more sensitive than all other teachers.
- Children whose teachers had at least a B.A. in early childhood education were observed to have higher percentages of responsive involvement scores than children with all other teachers.

Teachers with the most advanced education were the most effective (sensitive, responsive, constructive) overall.

- Children whose teachers had at least a B.A. in early childhood education engaged in more creative activities than children in all other classrooms.
- Children whose teachers had at least a B.A. in early childhood education or child development associate certificate training had higher frequencies of language play and positive management than children whose teachers had a high school education only.
- Children whose teachers had at least a B.A. in early childhood education or child development associate certificate training engaged in the most language activity.

Howes concludes that "coherent teacher preparation programs at various levels of cost and time investment are more successful in terms of effective teaching and children's experiences than having teachers simply take college courses or informal workshops. Although teachers with the most advanced education and training appear to be the most effective, teachers with associate of arts degrees and child development associate certificates were more effective than teachers with some college or just high school plus workshops." The Florida study suggests that while the B.A. in early childhood education is the most effective in terms of program quality and child outcomes, other blends of training and formal education can produce effective teacher behavior as well.

In his review of the CQCO study, and by extension of others like the NCCSS, Blau (2000) questioned whether unobserved characteristics of centers might be confounded with the effects of structural inputs, such as teacher education. Therefore, he re-examined the CQCO data using two different methods to control for false connections. One method controls for center-specific characteristics, and the other uses zip codes to control for location fixed effects. The hypothesis here is that the context in which teachers operate, whether it's the organizational characteristics of the center or the particular population served represented by income level in which services are provided, may cause biased estimates of the effects of particular variables. Blau's reexamination of the data underscored the persistent effect of the bachelor's degree while suggesting that the precise form of specialized training for staff in different positions may be more complex.

Three-State Study (Massachusetts, Georgia and Virginia)

In a study of early education and care quality in Massachusetts, Georgia and Virginia - three states with wide variation in regulations, Scarr and her colleagues (1994) examined the relationships among quality as measured by the ECERS and the ITERS, quality as measured by the Assessment Profile for Early Childhood Programs, and other quality measures of child care such as staff education and training. An infant, toddler and preschool classroom was observed in each of the 40 centers in the three

states. Staff background was captured through interviews and categorized into one of five groups: 1) no specialized training; 2) workshops or in-service training; 3) a child development associate certificate; 4) vocational school or high school training; and 5) college- or graduate-level early childhood courses. Education was captured in nine categories, ranging from none to an Ed.D. or Ph.D.

The Three State Study (Scarr et al., 1994), found that although teacher education and teacher training, along with adult-child ratios, showed modest significance with relationships quality measures, such as adult-child interactions and developmentally appropriate activities, teacher wages was the variable most highly correlated with process quality. As a result, Scarr et al. suggested that wages may be a better and more useful (although complex and indirect) indicator of center quality than other teacher characteristics. The researchers raised concerns, however, that the wide range of quality among classrooms in the sample may have affected the results.

In a later analysis of this data set (Phillips et al., 2000), teacher education and training contributed jointly to a significant percentage of the variance in classroom processes, over and above the effects of regulatory stringency and ratio compliance. For preschool classrooms, only wages and ratios predicted classroom quality. Recognizing that wages are a proxy for recruiting and retaining highly qualified staff, these findings suggest more exploration of how higher wages relate to the teacher background climate—the percentage of staff with various educational and training backgrounds within centers and classrooms—and how the composition of the staff as a whole affects teacher behavior and program quality.

Head Start FACES Study

The Head Start FACES (Families and Child Experiences Survey) study was designed to answer questions about the critical elements that lead to program quality and positive outcomes for children in Head Start. The study was based on a national random sample of programs, stratified according to region of the country, urbanicity, and percentage of minority families using the programs. Classroom quality data were drawn from 40 programs (180 centers, 518 classrooms and 3,200 children) that participated in FACES from fall1997 to spring 1998 (Zill et al., 2001). Staff and families were interviewed and children were assessed at entry into the program. Additionally, they were assessed in the spring, at completion of one or two years of Head Start, and again in the spring of their kindergarten and first grade years. Teachers provided information about their years of teaching experience, the highest level of education they had achieved, the number of courses in early childhood education they had completed, credentials obtained, and membership in professional organizations. One-day classroom assessments included the ECERS, the Caregiver Interaction Scale, and the Assessment Profile for Early Childhood

Definitions of Measures

Assessment Profile for Early Childhood Programs: An observational measure that provides a comprehensive systematic assessment of center quality. It is organized around a number of dimensions of care, such as Learning Environment or Scheduling.

Programs (Scheduling Scale and Learning Environment Scale).

Approximately one-third of the teachers had a B.A. or higher, and an additional one-third had some college-level experience. The quality of Head Start classrooms in this sample was higher than in most other studies of early education and care (Helburn, 1995; Whitebook et al., 1990). Researchers found that classrooms with higher levels of quality had teachers with higher levels of education, experience, and positive attitudes and knowledge about early childhood education. Higher levels of teacher education, which in this case were four-year degrees or higher, appeared to influence teacher attitudes and knowledge, translating into higher levels of classroom quality. Teachers rated higher in sensitivity had higher education levels as well. Preliminary results found that children in classrooms led by teachers with more education scored slightly higher on vocabulary knowledge and story and print concepts, but these relationships were modest. Further analyses of these data are expected to clarify the role of training, education and provider beliefs about practice. In addition, they are also expected to control for socioeconomic characteristics and other program-level factors. However, these initial results underscore the role of the four-year degree in enhancing program quality.

New Jersey Studies

As part of an ongoing effort in New Jersey (Barnett, Tarr, Lamy and Frede, 1999; Barnett, Tarr, Lamy and Frede, 2001) to assess the quality of early care and education that children receive in its lowest-income school districts, researchers assessed the quality of 120 community-based preschool programs for three- and four-year-olds. Staff provided information on the developmentally appropriate nature of their practices in the classroom. They were then observed in terms of their practices (developmentally appropriate practices indicate quality). Classrooms were also assessed using the revised ECERS (ECERS-R; Harms, Clifford, and Cryer, 1998). Teachers were categorized according to whether or not they had a B.A., and if so, whether the degree was in early childhood education or in another field. The highest quality programs, operated by the school districts, were those which required teachers to have bachelor's degrees and therefore employed a considerably higher percentage of B.A. level teachers. The researchers were unable to analyze differences between those with a specialized B.A. in

Higher levels of teacher education, which in this case were four-year degrees or higher, appeared to influence teacher attitudes and knowledge, translating into higher levels of classroom quality.

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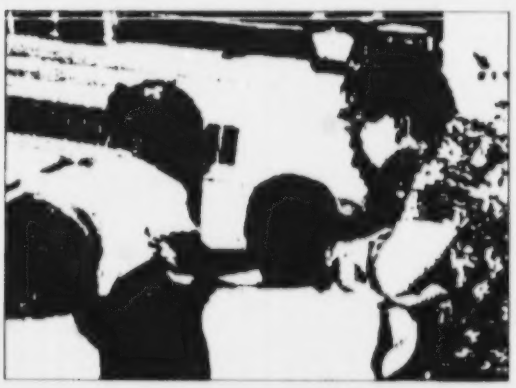
early childhood education and those who had majored in another field, in part because many teachers majored in elementary education with a concentration in early childhood education.

Then and Now: Changes in Child Care Staffing

Then and Now: Changes in Child Care Staffing, 1994-2000 (Whitebook, Sakai, Gerber and Howes, 2001; Whitebook and Sakai, in press) sheds some light not only on education and training, but also how wages influence center quality. The study examined the percentage of staff with different backgrounds who either stayed or left centers over time, their wages, and the impact of these factors on quality. The sample included 92 centers from three California communities studied over a period of six years. Preschool classrooms (one or two per program depending on center size) were visited three times, in 1994, 1996 and 2000. The authors recognize the limitations of the sample, and caution readers to view the findings as the best-case scenario for early education and care quality. Many programs in the sample sought and/or achieved accreditation by the National Association for the Education of Young Children (NAEYC: a nationally recognized organization that accredits early education and care settings, an indicator of quality), and teaching staff were highly educated, with 45 percent having completed at least a B.A., and 58 percent having completed a supervised practicum (Saluja and Clifford, 2002). Nevertheless, as one of the few longitudinal examinations of center quality and staffing ever conducted, the study merits some consideration.

In this study, classroom observations using the ECERS and Caregiver Interaction Scale were conducted in the same classrooms at each visit, and interviews were conducted with teachers to collect information about background and attitudes. Center directors also completed a staff census at each visit, providing information about the education, training, tenure and wages of all teaching staff in the center. Teachers were then categorized in two groups: those who had completed some college and some specialized training at the college-level, and those with a B.A. or higher degree and specialized early childhood education or child development training. The B.A. again played a prominent role in predicting center quality, along with other variables including nonprofit status, higher wages paid to teaching staff, and accreditation by NAEYC. Of note is the fact that it was not merely the presence of B.A. -level teachers that accounted for higher quality, but also the



"turnover climate" of the center, defined here as the percentage of teachers with at least a B.A. and specialized early childhood training who were retained at the centers between observations.

Results of a discriminant analysis indicated that for all teachers in the centers, highly trained teachers (B.A. -level or higher, with specialized training) were more likely to leave their jobs if they earned lower wages, worked with fewer highly-trained teachers, and worked in a climate with less stability. As we know, high teacher turnover can be an indicator of lower quality settings. These three predictors accounted for a significant percent of the variance of group membership (highly trained who leave, highly trained who stay, less trained who leave, less trained who stay). For observed teachers for whom they had more personal information, the authors found that in addition to the predictor variables mentioned above, membership in a professional organization also discriminated who left and who stayed. Highly trained observed teachers were more likely to leave the center if they earned lower wages, worked with fewer teachers with a four-year degree or higher, worked in centers with high turnover, and did not belong to a professional organization. Highly trained teaching staff who stayed earned $3.00 more per hour than highly trained teaching staff who left.

In addressing the question of which centers were able to sustain high quality over time, the study identified the presence of a greater proportion of teachers with bachelor's degrees or more as the strongest predictor of whether a center maintained a high level of quality. This study suggests that teachers do not function in isolation, and teacher characteristics must be understood in the context of the educational composition and stability of the staff as a whole.

Conclusion

As this review suggests, requiring bachelor's degrees with specialized training in early childhood development is a strong step toward ensuring good preschool programs for our three- and four-year-olds. However, as we ask the workforce to seek higher levels of education and training, we need to attend to related issues. We must ensure:

- that there are sufficient educational opportunities and support available to current and prospective teachers,
- that institutions of higher education build the capacity to respond to increased demand for high quality education and training, and
- that all programs have a coherent wage and career ladder that attracts and retains well-educated teachers in preschool settings.

The B.A. again played a prominent role in predicting center quality...

Questions related to the scope, content and format of training, both as pre-service and ongoing professional development, need additional investigation. Furthermore, researchers and policymakers need to address various strategies for teachers related to

such things as English proficiency, and the ability to communicate in other languages. We also need further clarification regarding the adult work environment in which teachers operate with other teachers and professionals. There is some evidence of how adult-child ratios, group size, compensation, mentoring, and appropriate supervision affect and support teachers' behavior in the classroom, as well as their decisions whether or not to remain on the job. Because early childhood classrooms are staffed by more than one adult, and classrooms within a program operate in concert to various degrees, more exploration is needed for how the background of other teachers affects teacher behavior and program quality, particularly as policymakers grapple with staffing policies for preschool classrooms.

Teachers of young children are increasingly called upon to have more sophisticated knowledge of children's capacity to learn, and of strategies to help them do so. The empirical research reviewed here underscore, on balance, the importance of more education and specialized training. The research further identifies the particular role of the bachelor's degree, most often in early childhood education, in producing teacher behaviors consistent with high quality programming, which in turn supports better outcomes for children.

As we know, teacher behavior is one of the major influences on child development (Shonkoff and Phillips, 2000), and understanding how to ensure that young children encounter teachers who are sensitive, appropriate and able to create responsive learning environments is one of the central questions facing those who develop and implement early care and education programs - publicly supported preschools in particular. The evidence to date suggests that the most effective teaching in center-based settings, and the skill and knowledge that defines it, are best achieved through a four-year college degree, which includes specialized content in early childhood education or child development.[1]

...teacher behavior is one of the major influences on child development

...teacher behavior in center-based settings, and the skill and knowledge upon which it rests, are best achieved through a four-year college degree, which includes, specialized content in early childhood education or child development.

[1] Please see a longer version of this literature review, *Early Education Quality: Higher Teacher Qualifications for Better Learning Environments*. http://www.iir.berkeley.edu/cscce

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Technical Notes

As mentioned, to be included in this review, articles were either published in peer-reviewed journals or reports subjected to a peer-review process. Our initial scan of articles included those that focused on programs in home and center settings serving all ages of children prior to elementary school. Because our immediate concern revolves around the appropriate staffing for publicly financed preschool programs for three- and four-year-olds, we restricted our review to those studies which could best address that issue. Thus, we initially narrowed this review to studies that examined programs with classrooms serving three- to five-year-olds, either exclusively or within a larger multi-age program, and that allowed for exploration of the particular features of high quality programs for the later preschool years. Consequently, studies focused exclusively on teacher background and infant/toddler development are not discussed in detail in this review (Burchinal, Roberts, Nabors and Bryant, 1996; Burchinal, Roberts, Riggins, Zeisel, Neebe and Bryant, 2000; NICHD, 1996), nor are studies that did not make the distinction between a Bachelor's and other levels of education.

We also limited this review to center-based programs, although a number of studies explore the role of family child care provider training and education as it relates to child care quality and children's outcomes (Clarke-Stewart, Vandell, Burchinal, O'Brien, and McCartney, 2002; DeBord and Sawyers, 1996; Kontos and Riessen, 1993, Kontos, Howes and Galinksy, 1996). These too, deserve exploration, particularly as some states move toward establishing publicly-supported preschool programs in home-based settings (Bellm and Whitebook, 2003). It is beyond the scope of this review to attempt a comparison of the literature for both center-based and home-based services, given the diversity across these sectors in terms of regulation, program structure and size, age groups of children served, and provider training, education and motivation. Having decided to focus on studies related to center-based care for three- and four-year-olds, we next categorized the studies according to research design. Some studies examine only teacher behaviors or overall program quality, and do not include child outcomes. Conversely, studies looking at child outcomes may include no specific information about teacher behavior. Thus, we divided studies from our initial scan into two categories, those which were observational studies of program quality (with and without child outcome data) and those which explored issues of teacher preparation but did not include direct observations of teacher behavior. The review focuses primarily on the observational studies.

Another distinction among the observational studies involves how they collect and analyze teacher background data. Some studies employ linear measures of education and training, either in designing variables or in conducting analysis. They look at training and education as continuous variables, and address only whether more education or

training makes a difference, but do not explore the particular role of the B.A. or of higher degrees in contrast to other levels of education. They may find, for example, that more education and/or training is better than less, but do not establish clear cut-off points (e.g., that an A.A. is less effective than a B.A.). As mentioned, since our focus is on the relationship between a B.A. and quality, we did not review studies that did not make this distinction.

In selecting studies for consideration in this review, we also examined the size and complexity of their samples and their analytic rigor. Some studies have small, insufficiently diverse samples with respect to locale or background characteristics of the subjects, which makes it difficult to generalize findings. Such studies may include so few teachers, for example, that is difficult to look at subgroup differences, or there may be little variation among subjects with respect to ethnicity or professional background. In such cases, it is impossible to determine the influence of caregiver socioeconomic status on levels of education. Further, many studies focus on samples selected from one locale, and thus the results are not necessarily applicable to states with different demographic or regulatory features.

Some studies over-represent certain subgroups (e.g., nonprofit child care centers or low-income families), which also limits the ability to generalize results. Some studies look at relationships among teacher characteristics and behaviors or child outcomes, but do not use multivariate statistics to understand predictors or effect sizes of various variables. In a few studies, observers were not completely blind to who had participated in various educational or training programs. To the extent possible, we concentrate on those with samples that include more settings in diverse regulatory environments, and those which employ multivariate analyses that explore the relative contribution of teacher education/training to positive program quality and child development.

There are few experimental designs or longitudinal studies in this literature. Some studies do not include information about pre-existing motivational or other differences among subjects, such as sufficient detail about how program structure, work environment or background climate (i.e., the

educational and training background of one's co-workers) impacts teacher behavior and child outcomes. None of the studies look at the interactions among formal education, child-related training, and the linguistic and cultural match between young children and their teachers. It is important to note that the studies reviewed here rely on the natural variation in teacher background that occurs in early care and education programs, and that the samples were drawn to capture the variation of programs in a particular community rather than to test various program designs.

Also, this review encompasses early education and care programs broadly defined, rather than looking only at publicly-funded preschool programs and variations among them based on teacher background and other features. We therefore cannot determine whether there are specific features of such programs, such as length of day or curriculum content, that may interact with teacher background so as to impact program quality and child outcomes differently than in other types of early care and education services. In many ways, state-funded preschools share as many characteristics with early elementary schools as they do with child care in terms of structures and goals, and may require different lines of investigation to answer questions around appropriate teacher preparation.

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